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U.S. Department of Transportation
Office of the Secretary of Transportation

General Counsel

1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

September 15, 2008

Hon. Anne K. Quinlan
Surface Transportation Board
395 E Street, S.W.
Washington, D.C. 20423

Re: Ex Parte No. 664 (Sub-No. 1)

Dear Secretary Quinlan:

Enclosed herewith for filing in the above-referenced proceeding please find the Comments of the United States Department of Transportation.

Respectfully submitted,

PAUL SAMUEL SMITH
Senior Trial Attorney
(202) 366-9280

Enclosure

Before the
Surface Transportation Board
Washington, D.C.

Use of a Multi-Stage Discounted Cash Flow Model In Determining the Railroad Industry's Cost of Capital	)	Ex Parte No. 664 (Sub-No. 1)

Comments of the
United States Department of Transportation

Introduction

The Surface Transportation Board ("STB" or "Board") is proposing to adopt a Multi-Stage Discounted Cash Flow ("MS-DCF") model as a complement to the Capital Asset Pricing Model ("CAPM") for determining the railroad industry's cost of equity, a major component of the cost of capital. Notice served August 11, 2008 ("Notice"). The cost of capital estimate in turn is used in a variety of regulatory contexts: the Board's annual revenue adequacy determinations, rate cases, feeder line applications, rail abandonments, and trackage rights compensation cases. [1]

The United States Department of Transportation ("DOT" or "Department") continues to support generally the use of MS-DCF in conjunction with CAPM to improve the reliability and stability of the STB's cost of equity calculation, and supports in particular the Board's choice of the Morningstar/Ibbotson MS-DCF model. DOT recommends that in implementing this decision the STB use a simple average of the two

[1] The cost of capital estimate is also used in the STB's Uniform Rail Costing System ("URCS"), which is used to calculate each Class I railroad's system average variable unit cost for purposes such as determining the Board's jurisdiction over certain matters. *See Adoption of the Uniform Rail Costing System for all Regulatory Costing Purposes*, 5 I.C.C.2d 894 (1989).

methodologies. Finally, we urge the Board to periodically revisit this subject to confirm the value gained through combining these methodologies.

The Cost of Capital and the STB

Investors must be compensated for the use of their capital by any company, including railroads. The cost of capital consists of the cost of debt and the cost of equity, and only the former is ascertainable with some degree of certainty; the latter can only be approximated. There is no single "correct" means of determining this cost. The cost of capital estimate, however calculated, is intended to inform companies and regulators of the return on investment required by investors. *See* STB Ex Parte No. 664, *Methodology to be Employed in Determining the Railroad Industry's Cost of Capital* (STB served Jan. 17, 2008)("*Capital Methodology*").

Federal law requires the Board to estimate the cost of capital each year for particular regulatory purposes, such as determining the reasonableness of rail rates and the adequacy of the revenues earned by individual rail carriers. *See* 49 U.S.C. §§ 10701, 10702, 10704(a)(2), (3). The Department has previously acknowledged that the cost of capital as estimated by the STB will have a significant impact on the nation's transportation system and that estimating the cost of capital accurately is critical. *See* DOT Reply Comments in Ex Parte No. 664, filed October 29, 2007. The cost of capital must reflect real-world financial conditions, for otherwise either the railroad industry may be hindered from attracting or retaining enough capital to maintain a reliable system, or captive shippers may be subject to excessive rates with improperly limited regulatory protection. *Id.* at 7.

From 1985 through 2005 the Board relied on a single-stage DCF model to calculate the cost of equity. That model assumed a constant growth rate, however, which proved problematic. The agency therefore sought to adopt a more accurate method in a related proceeding -- Ex Parte No. 664. Earlier this year in that proceeding the STB changed the methodology for determining railroad cost of capital by replacing the single-stage DCF with CAPM. *Capital Methodology*, *supra.* In selecting CAPM, the Board discussed the possibility of improving its overall results by combining CAPM with a MS-DCF model. *Id.* at 12-14. The STB deferred consideration of that question in light of the need both to fulfill its regulatory responsibilities and to acquire additional information on potential MS-DCF candidates. *Id.*

The Board began the instant proceeding to explore the merits of this possibility with an Advanced Notice of Proposed Rulemaking ("ANPRM"). STB Ex Parte No. 664 (Sub-No. 1), *Use of a Multi-Stage Discounted Cash Flow Model in Determining the Railroad Industry's Cost of Capital*, (STB served February 11, 2008). The agency asked for comments on an appropriate MS-DCF model and established four criteria, derived from the record in Ex Parte No. 664. First, the DCF model should be a true multi-stage model. [2] Second, the DCF should not be focused on dividend payments only. [3] Third, the DCF model should be limited to railroads that pass previously adopted screening

[2]/ This requires that the DCF utilize more than one time period, and that the growth rate assumption not remain constant (as it does in a single-stage DCF).

[3]/ This criterion recognizes that dividends do influence stock prices, but are not the only way that companies return profits to shareholders. The DCF model chosen must include broader measures of cash flow.

criteria to identify efficiently run carriers. [4] Fourth, the model adopted should enhance the accuracy of the cost of equity calculation when used in conjunction with CAPM. [5]

The Morningstar/Ibbotson Model

Replies to the ANPRM produced two potential models. The STB has proposed to adopt the Morningstar/Ibbotson model advanced by the Association of American Railroads. The Board found that this model met the above four requirements and had the additional advantages of being produced by disinterested, respected third parties (rather than by advocates of a particular outcome) as well as being commercially accepted within the financial community. The second model tendered did not share these advantages.

First, the Morningstar/Ibbotson model is a three stage DCF with the first stage covering years 1 to 5, the second stage from years 6 to 10 and third stage from year 11 onward.[6] Second, the model incorporates a broad measure of cash flow and does not rely on dividends alone. [7]

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[4]/ *Railroad Cost of Capital—1984*, 1 I.C.C. 2d 989 (1985).

[5]/ This factor reduces the variance that results when relying on CAPM alone.

[6]/ In the Morningstar/Ibbotson model, the growth rate (g_{i1}) used in the first stage is the median value of forecast growth rate for the next 3 to 5 years. In the second stage, growth rate (g_{i2}) used is the average of the earnings growth for the qualifying railroads. Lastly, growth rate in the third stage (g_{i3}) is the forecast long-run growth of the U.S. economy. It would follow the form in the equation below where g_{i1}, g_{i2}, and g_{i3} represent the different growth rates in the near, mid and long term respectively and CF_{it} reflects the average expected cash flow in year t for firm i, and r_i is the cost of equity for firm i.

$$MV_{i0} = \sum_{t=1}^{5} \frac{CF_{i0}(1+g_{i1})^t}{(1+r_i)^t} + \sum_{t=6}^{10} \frac{CF_{i5}(1+g_{i2})^{(t-5)}}{(1+r_i)^t} + \frac{\dfrac{IBEI_{i10}(1+g_{i3})}{r_i - g_{i3}}}{(1+r_i)^{10}}$$

MV_{i0} = market value of firm i in year 0,
CF_{it} = average cash flow for firm I at the end of year t
g_{ij} =earnings growth for firm i in stage j (j = 1, 2, or 3)
$IBEI_{10} = IBEI_0 (1+g_1)^5 (1+g_2)^5$
$IBEI_0$ is determined by the same process as CF_0

Third, the model as presented by AAR has been modified to incorporate only those railroads that passed the aforementioned screening criteria. Fourth, the Morningstar/Ibbotson model has been shown to reduce the variance resulting from relying on the CAPM alone and has improved the precision of the cost of capital calculation. *Id.*

The Department's Position

The record in Ex Parte 664 demonstrated that an attempt to identify one financial model as superior in all respects to others is likely doomed to failure, because each possesses strengths, weaknesses, and some degree of arbitrariness. Moreover, the validity of different models may wax and wane with the state of the economy at any given time; one may be more responsive to short-term commercial or financial fluctuations, while another may deliver more stable results over longer periods.[8]

Economic and financial academic research accordingly tends to favor combining different models in order to obtain results superior to those produced by a single model. [9] Using two models in conjunction diminishes uncertainty and improves confidence in the overall estimate of the cost of equity, because each model adapts to changes in the

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[7]/ The Board noted that "it accounts for all of the relevant cash flows a reasonable investor is likely to anticipate." Notice at 5.

[8]/ *See* Guidolin, M and A. Timmermann, 2007, *Forecasts of U S. Short-term Interest Rates: A Flexible Forecast Combination Approach.* Federal Reserve Bank of St.Louis, Working Paper Series 2005-059C

[9]/ *See* Graham, E. and A. Timmerman, 2008. *Economic Forecasting*, Journal of Economic Literature, 46, 3-46.

economy in different ways, protecting against factors that might on occasion bias the results from a single model.

The Department originally supported use of a second model as a "check" on the accuracy and reliability of CAPM, at least for a transitional period from the prior DCF methodology. [10] The record in this proceeding strengthens the case for the use of two models. The Morningstar/Ibbotson MS-DCF methodology is particularly suitable for use with CAPM for the reasons advanced by the Board. DOT recommends that the STB periodically review this decision to assess the continued value gained by combining these models.

The Board has also asked for comment on the best way to implement using these two models, "and whether a simple average is the best approach." Notice at 6. The Department submits that it is. Although there are different methods available, academic literature appears to suggest that use of the average is relatively efficient as well as simple. By contrast, alternatives have their own drawbacks. [11] The record here clearly demonstrates the value of this course: combining the two estimates in a simple average

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[10]/ DOT Reply Comments in Ex Parte No. 664.

[11]/ Other methods assign different weights to each model based on the correlation in forecast errors across models by regressing the predicted variable y on each forecast ($f_i(z,\theta)$) and an intercept (β_0) as shown in the equation below, or a Bayesian method, which can be considered more sophisticated and which is becoming increasingly popular.

$$y = \beta_0 + \sum_{i=1}^{n} \beta_i f_i(z,\theta) + \varepsilon$$

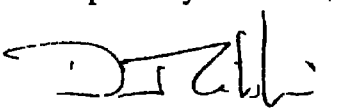
However, the adoption of one of these two methods might require the STB to make additional assumptions due to the lack of historical data required by these methods and the subjectivity of the cost of equity estimate Furthermore, the precision gain obtained from alternative combination methods seems to be marginal.

provides a more reliable, less volatile estimate of the cost of equity and reduces the variance of the estimate over time. [12]

CONCLUSION

The importance of the railroad industry's cost of capital calculation demands a reliable and realistic estimate of the cost of equity. Use of the Morningstar/Ibbotson MS-DCF model in conjunction with the recently adopted CAPM methodology should consistently produce such estimates, and periodic assessments would confirm this. The Department urges the Board to combine the two methodologies by using a simple average on the basis of the simplicity, transparency, and precision of this approach.

Respectfully submitted,



D.J. GRIBBIN
General Counsel

September 15, 2008

[12]/ Comparisons of the results of the CAPM and the Morningstar/Ibbotson three-stage DCF estimates over a ten year period (1998-2007) show that CAPM ranged from 9.7% to 12.7% with a standard deviation of 0.93% while the three-stage DCF ranged from 11.6% to 14.6% with a standard deviation of 0.92%. Averaging the two resulted in a range of 11.1% to 13.4% with a standard deviation of 0.75%, thereby demonstrating a more stable result.